ARCHITECTURAL AND ENGINEERING PLANNING SECTION
RURAL RESETTLEMENT DIVISION
RESETTLEMENT ADMINISTRATION
WASHINGTON, D. C.

SPECIFICATIONS FOR ELECTRICAL WORK IN HOUSES AND OUTBUILDINGS AT OREGON SCATTERED FARMS, McMINNVILLE, OREGON REGION XI.

January 16, 1937

Project No. RR-OR-10

SPECIAL CONDITIONS

SC-1. DISCREPANCIES:- Where no figures or memoranda are given, the drawings shall be accurately followed. In case of discrepancy between drawings and specifications, the specifications shall govern.

SC-2. PLANNERS' REPRESENTATIVE:- Wherever the words "Proper Authority" occur in the specifications it shall be construed to mean the Planners' Representative on the job.

SC-3. DRAWINGS:- These specifications have been prepared to cover the following drawings:

Plan No.	Sheet No.
E	1 to 19, Inc.

These Specifications consist of Cover Page, Special Conditions Page SC-1, and Pages 1 to 9 , inclusive.

ELECTRICAL WORK.

100. SCOPE:- This Specification shall cover all labor and equipment necessary to form a complete electrical system (both inside and outside) on each unit at the Oregon Scattered Farms Project, Yamhill Unit, as indicated on Drawings E-1 to E-19, inclusive. This work shall cover the installation from the service entrance conductors at the house to and including every light and power outlet and switch shown on the plans for the various buildings and the plot plans for each unit, the necessary main switch and fuses; branch circuit panel, wall switches, receptacles, fixtures, poles, and outside wiring on each unit, all properly connected ready for connection to the electric power company's service.

101. MATERIAL AND WORKMANSHIP:- All materials, whether specifically mentioned and described herein or not, except portions of service equipment that may be supplied by a Public Utility Company, shall be furnished by the Government. They shall be new and of approved types, inspected and listed by the Underwriters' Laboratories, Incorporated. They shall be installed in a neat and workmanlike manner in accordance with these specifications, with the rules of the current edition of the National Electrical Code, and with the Electrical Code of the State of Oregon (hereinafter called the Code). These rules and laws are hereby made part of these specifications.

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Outlet locations, circuit arrangement, switch control and other matters not covered by, and not in conflict with said rules and laws, shall be as shown on plans and/or described in these specifications; or, if not indicated, shall be in accordance with approved practices.

102. INSPECTION AND TESTS:- All work shall be inspected, tested and left free from mechanical and electrical defects.

All work shall be inspected by the Bureau or Department of the Fire Underwriters' Association, Federal or State Government, or other authority exercising jurisdication over electrical installations in the area including the site and certificate or letter of approval from that authority shall be obtained.

The first or rough wiring shall be inspected by the authority having jurisdiction, and a letter or certificate of approval, covering the complete installation, obtained.

Inspections and tests shall be conducted in the presence of the authority who, ultimately, is to accept the work.

103. SERVICE ENTRANCE CONDUCTORS:- (In Standard Rigid Conduit). Service entrance conductors and equipment shall comply with the rules of the Code, and shall be grounded and bonded in accordance with the rules of Article 9 of the Code. Service entrance conductors shall consist of 3 No. 6 A.W.G. (American Wire Gauge), 0-600 volt, rubber insulated wires with moisture-resisting and flame-retarding braids (Federal Specification No. J-C-106.

One wire shall be identified by a white or natural gray braid, and shall be grounded. Wires shall extend two feet beyond conduit service head. Service entrance conductors shall be enclosed in 1-1/4 inch, zinc-coated, rigid steel conduit (Federal Specification No. WW-C-581a.) The conduit shall terminate at a point approximately fifteen feet above finished grade, if the construction of the building will permit, but in no case less than ten feet above finished grade. It shall be securely fastened with zinc-coated, malleable iron, single-hole pipe straps at intervals not exceeding five feet and shall be fitted with a zinc-coated service head.

Extend service conduit and wires to service entrance switch and make all required connections.

The location of the service, and the type and location of the service equipment, shall be in accordance with the regulations of the Public Utility Company that will serve the premises. Its officials should be consulted beforehand. Open wires shall not cross, or be within reach of windows. When necessary, suitable painted panels, or backboards of clear sound wood, not less than 7/8 inches thick, shall be installed for the mounting of meters and other service equipment.

Where exposed to the weather, all boxes and fittings shall be types approved for outdoor use.

Joints, couplings, and connections of conduits to cabinets, enclosing meters and other equipment, shall be rain-tight. Raw threads shall be painted to resist corrosion.

Where service conduit enters cabinets through knockout holes, it shall be bonded in accordance with requirements of the Code. Approved bonding or grounding bushings with set screws may be used for the purpose in lieu of bonding jumpers. The neutral conductor shall be bonded to the cabinet enclosing the service entrance switch.

Wherever a change in the direction of the conduit is necessary, the conduit shall be bent, if practicable, in preference to using elbow fittings, except where conduit enters the wall at the end of a horizontal or vertical run, a special malleable iron service ell with rain-tight cover may be used.

The service entrance conduit system shall be arranged so as to drain.

Where conduit enters the wall, it shall be so installed that water will not follow it. The hole shall be sealed with suitable material.

104. SERVICE ENTRANCE SWITCHES AND FUSES:- Furnish and install where shown on plans, or where directed by Proper Authority, a 60-ampere, 3-pole, 125/250 volt, fusible entrance switch of the fuse puller type, with one 30-ampere, 3-pole, 125/250 volt, fuse puller switch (for outbuildings), and six circuit single plug fuse dead front branch circuit panel. (Fed. Spec. No. W-F-831). Entrance switch and branch circuit cutouts shall be mounted in steel cabinet arranged for surface mounting. Equipment shall be equal and similar to Colt-Noark Catalog No. 9HL6L.

105. FUSES:- Install in the branch circuit panel a complete set of 15-ampere, 125-volt, N. E. Code, Plug Fuses (Federal Specification No. W-F-831).

If service entrance fuses are not provided by the Company supplying the electrical energy, 50-ampere, 250-volt, N. E. Code, non-renewable cartridge fuses (Federal Specification No. W-F-791) shall be furnished and installed.

Install in 30-ampere, 3-wire branch circuit, two 30-ampere fuses.

106. GROUNDING OF SYSTEM AND EQUIPMENT:- The neutral wire of the service entrance conductors, the service entrance conduit, and metal enclosing cabinets of service entrance equipment, shall be grounded or earthed as required in Article 9 of the Code, and as specified herein. There shall be separate grounding conductors for the system neutral and for the equipment, conduit, cabinets or boxes enclosing meters, entrance switch, etc. Grounding conductors shall be connected to a continuous metal pipe, underground, water supply system, or to the pipe line from a water well on the premises, if buried in moist earth; in absence of underground pipe line of any kind, to approved rods driven at least eight feet into the earth.

Grounding conductors for equipment and system shall be installed by one or more of the following described methods:

(a) No. 8 A.W.G. R. C. wire attached to the neutral wire or terminal, provided for the purpose, in service entrance switch or meter cabinet, and carried through half inch zinc-coated conduit to grounding fitting attached to water pipe. The conduit shall be bonded to the metal cabinet and terminate in an approved fitting attached to water pipe. Grounding fittings shall be rugged mechanical devices known as conduit type.

(b) No. 8 A.W. G. single conductor armored bushed cable with the wire attached to the neutral wire or terminal, provided for the purpose, in service entrance switch or meter cabinet, and the armor shall be bonded to the metal cabinet and shall terminate in an approved fitting attached to a water pipe. Ground fitting shall be a rugged mechanical device for use with armored cable.

107. ADDITIONAL GROUNDING REQUIRED:- The resistance of artificial grounds should be measured. If not below the minimum of twenty-five ohms, required by N. E. Code rule 907-d, one or more additional electrodes shall be installed and connected in parallel with the first.

In case only one house is connected to one transformer, two system grounds, one of which may be at the transformer, must be installed.

108. CONTACTS:- All surfaces, where electrical connections and grounds are made, must be clean and free from enamel, paint, grease, etc. A small amount of enamel shall be removed at knockouts in entrance equipment and fuse panels, where conduits or cables enter.

109. INTERIOR WIRING METHODS:-

House

Conceal wiring wherever possible, using armored bushed cable. Any exposed wiring shall be run in surface metal raceway.

Barn, Poultry House

Interior wiring shall be run on the surface or through bored holes in joist using non-metallic sheathed cable. Wires shall be suitable protected as provided in Article 5 of the Code.

All splices and taps, including those made in boxes, shall be soldered and insulated with rubber splicing tape overlaid with friction tape to equal the original insulation of the wire. Braids and rubber scorched during soldering shall be trimmed away to expose at least one-half inch of undamaged rubber, which shall be scraped clean, before applying the rubber tape, which shall be slightly stretched and wrapped under tension.

Rubber splicing tape shall be black or gray in color, shall be three-fourth inches wide and comply with Federal Specification No. HH-T-111.

Friction tape shall be black or gray in color, shall be three-fourth inches wide and comply with Federal Specification No. HH-T-101.

Wire solder, 60% tin, 40% lead and non-corrosive soldering paste, listed by Underwriters' Laboratories, Inc., shall be used. Excess flux shall be removed from joints before tape is applied. Joints made in boxes and in fixture wiring may be pig-tail type.

All connections shall be made up during the first wiring, and free ends not less than six inches in length shall be left in outlet boxes, and wall switches and receptacle boxes, ready for connection to devices and fixtures.

Where a change is made from concealed work to surface metal raceway, and where one of the materials necessarily may be installed on a 1-inch partition, an approved terminal fitting, suitable for use with the metal raceway, and having a bushed hole for the conductor in its wall or an insulating cover, shall be used. The wires shall pass through this fitting without splices, taps, or joints within the fitting or raceway.

Wiring on 1-inch partitions shall be run in closets, if possible; otherwise, metal raceway must be used.

110. CABLE WORK FOR BARNS AND POULTRY HOUSES:- Metallic-sheathed cable for Houses shall be N. E. Code, 0-600 volt, standard, conforming to Federal Specifications J-C-101a and J-C-71, and shall contain no circuit wire smaller than No. 12 A.W.G.

Non-metallic sheathed cable for Barns and Poultry Houses shall be N. E. Code, 0-600 volt, standard, with rubber insulation conforming to Federal Specification J-C-101a, and an overall braid conforming to the Underwriters' specifications. No circuit wires shall be smaller than No. 12 A.W.G.

Coils shall have Underwriters' labels attached when delivered to the job.

All cable shall be carried through or parallel with joists and studding. It shall not be run diagonally across ceilings and walls.

Cable shall be fastened to sides of framing members with approved metal straps at intervals not exceeding four feet.

Cable shall be looped from outlet to outlet and all joints made in outlet or switch boxes. Cable damaged by fastenings, kinking, binding, or otherwise, shall be removed.

Non-metallic sheathed cable, passing through floor, shall be enclosed by rigid conduit or pipe extending at least six inches above the floor.

Cable shall be protected against mechanized injury, where necessary, by rigid conduit or pipe, or substantial guard strips or other approved means.

Cable shall not be run in unfinished, unexcavated space below first floor, unless installed in approved conduit.

All wiring shall be neatly and systematically arranged.

111. SURFACE METAL RACEWAY WORK IN HOUSE:- The metal raceway shall be an approved 2-piece moulding type, with all necessary fittings, clips, elbows, couplings, outlet boxes, etc., to make a complete job.

Raceways shall be used in exposed dry locations only.

Raceways may be extended through dry walls, dry partitions and dry floors, if in unbroken lengths where passing through.

Raceways shall be continuous from outlet to outlet, fitting to fitting, or outlet to fitting.

Conductors in raceways shall be continuous from outlet to outlet.

Raceways and fittings shall be grounded when and as prescribed in Article 9 of the Code.

112. LOCATION OF OUTLETS:- Wire to all outlets for lights, convenience receptacles, and switches shown on the plans and/or mentioned in these specifications.

Wall switches shall be placed so that the center of the switch is 4'-3" from the finished floor and not more tham 6 inches from adjacent trim, unless otherwise directed.

Convenience outlet receptacles shall be placed so that the center of receptacle is 1'-2" from the finished floor, except as otherwise noted.

Outlets over kitchen counters shall be placed so that center of receptacle is 3'-6" from finished floor.

Outlets for wall brackets shall be located as follows:

Bathroom Brackets over Medicine Cabinet - 7'-2" from finished floor to center of outlet box.

All other Wall Brackets - 5'-8" from finished floor to center of outlet box.

Single switch plates shall be vertical. Gang switch plates and convenience outlet plates shall be horizontal.

Where outlets for switches and receptacles in concealed wiring are located on wainscoting or hollow walls, surfaced with wood, the wires shall be brought out through holes cut by a carpenter, and the boxes installed after the boards are in place.

113. OUTLET AND SWITCH BOXES (Description and Installation):- Boxes suitable for the purpose, the location and for the number and the sizes of wires, entering them, shall be installed at each outlet. All boxes except those exposed to weather or excessive moisture, or designed for use with metal surface raceway, shall be drawn or stamped steel, zinc coated (Federal Specification No. W-C-821).

Boxes exposed to weather or excessive moisture shall be malleable iron zinc coated.

When necessary, suitable covers for boxes shall be provided.

The number of wires that may enter a box of certain size is specified in the Code.

Boxes for ceiling and bracket outlets shall be octagonal, 4 inches nominal diameter, $1\frac{1}{2}$ inches deep, provided with 3/8-inch fixture studs integral with the box or as part of the metal support. They shall be mounted on metal bar hangers, except on exposed beam ceilings and so installed that their edges shall be flush with the finished surface of the wall or ceiling. They shall be equipped with clamps or connectors that will securely grip non-metallic sheathed cable, including No. 12/3 or armored bushed cable including 12/3.

Boxes for outlets on exposed beam ceilings shall be of the surface-mounted type for use with surface metal raceway.

Boxes for wall switches and receptacles in hollow partitions shall be sectional, interchangeable type, $2\frac{1}{2}$ inches deep, zinc coated and provided with clamps or connections for non-metallic sheathed cable including No.12/3. They shall be provided with ears and installed after wall finish is in place.

Any damage or defacement of the surface finish of walls or ceilings around boxes that will not be completely covered by a switch or receptacle plate or fixture canopy shall be satisfactorily repaired.

114. SWITCHES AND RECEPTACLES:- Switches shall comply with Federal Specification No. W-S-893.

Receptacles shall comply with Federal Specification No. W-R-151.

The mechanism of switches and receptacles shall be enclosed in housings or bodies of molded, hard, non-absorptive, fire-resistant, phenolic composition. The cover plates of the switches and receptacles shall be of the same material as the boxes, and shall be flat black in color. Cover plates shall be rectangular in shape; they shall be straight and true and of such thickness and construction as will provide ample strength and prevent warping. They shall have plain stippled surface. If ornamented, the design shall be simple.

When two or more switches or receptacles are located at one point, they shall be mounted under one gang plate. Single-pole and three-way switches shall have markings to indicate open and closed positions and shall be installed to have handles move upward to a closed position.

Receptacles for convenience outlets shall be standard duplex type, rated 15 amperes at 125 volts, and shall have T-slots in cupped depressions, or other approved means, for guiding insertion of plugs. Blade-receiving terminals shall provide contact on both sides of blade.

In two-story houses, the second floor hall light shall be controlled by one set of three-way switches.

When surface mounted switches or receptacles are used, they shall be of the type for use with surface metal raceway.

Any damage or defacement of the basic material or of the surface finish of walls not completely covered by a switch or receptacle plate shall be satisfactorily repaired. Switch and receptacle plates must be free from cracks and other defects after installation; shall be in contact at all points with the surface on which they are mounted; and shall be plumb and accurately aligned with adjacent trim.

115. BRANCH CIRCUITS:- Wires for branch circuits shall not be smaller than No. 12 A.W.G. All circuits shall be two-wire, unless otherwise indicated on plans.

The circuit arrangements shall be as shown on plans.

116. LIGHTING FIXTURES:- Lighting fixtures shall be assembled, wired, and hung as directed. Splices and taps shall be soldered and shall be insulated with rubber splicing tape and friction tape.

Details of wiring and installation, including protection of combustible ceiling and wall finishes behind canopies and plates shall be in accordance with the Code.

Fixtures shall conform to the following specifications:

Wall Fixtures in House or Outbuildings (Both Surface and Flush Mounted) - One-light, porcelain receptacle, with pull chain and insulated link, for mounting in 4-inch outlet box.

Ceiling Fixtures in House or Outbuildings (Both Surface and Flush Mounted) - One light, porcelain receptacle, keyless socket, for mounting on 4-inch outlet box.

117. PUMP ROOM:- Install in the pump room a 30-ampere fused disconnect switch for the pump motor.

The circuit for the operation of the deep well pump shall be 220 volt circuit, run from the fuse panel, tapping off of two opposite fuses.

Run circuit from the load side of the switch to the pump motor in rigid steel conduit.

118. OVERHEAD SYSTEM (Between House and Outbuildings):- From the house run the feeders to the various outbuildings as indicated on the plot plans, these wires to be strung so as to provide a clearance of 15'-0" above grade in all cases.

Wood poles shall be 25'-0" long, American Standard Association, Class 7, with a minimum top circumference of 15 inches. They shall be set so that at least 5'-0" of the pole is in the ground.

The poles shall be butt treated for a distance of 8'-0" from the butt with a brush coat of carboleneum or coal tar creosote. The poles shall be free from injurious checks or short crooks; shakes not exceeding 90° will be acceptable.

The earth around the pole shall be well tamped.

Two or three spool insulator racks as required shall be installed on the poles by means of a galvanized through bolt at the top and bottom.

From the house to the various outbuildings, run No. 10 T.B.W.P. wire, conforming to U.R.C. specifications. The wire shall be strung on the insulator racks and securely tied with soft drawn weather-proof tie wire. At the various buildings, the wires shall be attached as indicated on the drawings.

119. ALTERNATE:- An alternate estimate shall be worked out, based on the use of non-metallic armored cable Type US E for underground service. The cable shall extend directly from the house to the nearest structure, and from that building extended to the third structure.

Cable shall be covered with 2" material for Mechanical Protection before backfilling is started.